DIRECTIONAL INPUT SYSTEM WITH AUTOMATIC CORRECTION

[0001] The present application is a continuation-in-part application to the copending application, U.S. Ser. No. 09/580,319, filed on May 26, 2000, entitled "KEYBOARD SYSTEM WITH AUTOMATIC CORRECTION", and continuing application, U.S. Ser. No. 10/205,950, filed Jul. 25, 2002 entitled "CHINESE CHARACTER HANDWRITING RECOGNITION SYSTEM".

BACKGROUND OF THE INVENTION

[0002] 1. Technical Field

[0003] This invention relates generally to input devices. More particularly, the invention relates to a directional input system with automatic correction.

[0004] 2. Description of Related Arts

[0005] To operate a computing device, such as a computer, one or more input devices must be connected thereto. Since the early days of the computing age, the keyboard has been the primary input device for users to input textual messages into to computing devices. The textual messages may be commands for the computers to execute, or just plain data entry if he's using a keyboard as an input device. However, the user must memorize the correct spelling and syntax of computer commands. Even if the user has memorized the correct spelling, the input of data with keyboard itself can be error prone. Hence, a graphical user interface (GUI) has been developed for computing devices to reduce the use of keyboard. In a GUI, the user operates an alternative input device, such as a mouse, trackball, or joystick, to move around a cursor or pointer on the display. Once the cursor is moved to the desired position, a button is pressed and released, and a corresponding computer command is thus executed. Although a GUI provides an alternative way to invoke computer commands, the keyboard continues to serve as the primary text entry input device for computing devices.

[0006] Nevertheless, there are situations such as in console video-game machines or hand held devices with a joystick or joystub, where a traditional keyboard is neither available nor convenient. Currently, the text entry method for these systems usually consists of scrolling through an alphabet or on-screen QWERTY keyboard. Another commonly adopted navigation means in video-game machines provides users with a pie menu, which is a circular menu that allows users choose items by dragging the pointing device in the direction of the menu item. To input a word, the user must select each letter by scrolling through an alphabet list, navigating through the pie menu, or locating it on the on-screen keyboard and click a selection button after each letter is located.

[0007] The above text entry method has numerous disadvantages. For example: the method is inefficient because the user has to spend time in locating the letter and confirming the letter; the method is inconvenient because it breaks the normal typing flow when inserting clicks between letter selections; and the method is ineffective because the user could easily mistake an adjacent letter for the limited size of the on-screen keyboard.

[0008] What is desired is an effective text entry input system using a directional input means such as a joystick or trackball device. It is further desired that the text entry input system is intuitive and easy to operate. It is still further desired that the text entry input system can provide auto-correction of input mistakes.

SUMMARY OF THE INVENTION

[0009] The invention provides a directional input system associated with a text entry application, such as email or instant messaging. The system comprises an optional onscreen representation of a circular keyboard, a list of potential linguistic object matches, and a message area where the selected words are entered. The circular keyboard is manipulated via a hardware joystick or game-pad having an analog joystick or omni-directional rocker switch built therein. The user points the joystick in the general direction of the desired letter, and then continues pointing roughly to each letter in the desired word. Once all letters have been roughly selected, buttons or equivalent means are used to select a specific word from the list of potential matches and to send the selected word to the message area.

[0010] In one preferred embodiment, the invention provides a text entry input system which includes: (1) a directional selection means, plus one or more buttons or equivalent user input means; (2) a list of linguistic objects, organized by frequency of use; (3) an output device with a text display area; and (4) a processor which includes an object search engine, a distance or angular value calculation module, word module for evaluating and ordering words, and a selection component.

[0011] The directional selection means is used to point in the direction of each letter of a word. The processor calculates a distance or an angle to find letters and weight values for the letters in the pointing direction with the distance or the angle calculation module, retrieves a predicted list of words based on the letters and weight values with the object search engine, and evaluates and orders the predicted list of words with the word module. The selection component is used to select a desired word from the predicted list of words.

[0012] In another preferred embodiment, the invention provides a text entry input method using a directional selection means. The method includes the steps of:

[0013] The user moving a cursor on an on-screen keyboard in the direction of a desired letter using the directional input means;

[0014] Recording the X-Y coordinate position of the cursor;

[0015] Converting the recorded X-Y coordinate position into the corresponding set of polar coordinates;

[0016] Applying a selection weight value to each input based on the set of polar coordinates of the recorded cursor position; and

[0017] Retrieving a list of predicted words from a vocabulary database based on the weight value for each input and a plurality of pre-determined values.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] **FIG. 1** is a block diagram illustrating a directional input system according to the invention;